

NON-PUBLIC?: N
ACCESSION #: 8908230428
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Diablo Canyon Unit 2 PAGE: 1 of 5

DOCKET NUMBER: 05000323

TITLE: Manual Reactor Trip To Seawater Inleakage from a Condenser Tube Sheet
Plug Failure
EVENT DATE: 07/16/89 LER #: 89-007-00 REPORT DATE: 08/15/89

OPERATING MODE: 1 POWER LEVEL: 27

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: James C. Nolan, Regulatory Compliance TELEPHONE: (805) 595-4509

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: SG COMPONENT: COND MANUFACTURER:
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On July 16, 1989 at 0258 PDT, Diablo Canyon Power Plant (DCPP) Unit 2 was manually tripped in accordance with DCPP Abnormal Operating Procedure AP-20, "Condenser Tube Leak." A 4 hour non-emergency report was made to the NRC at 0358 PDT on July 16, 1989 in accordance with 10 CFR 50.72(b)(2)(ii).

DCPP Unit 2 was in a planned maintenance curtailment at about 50 percent power for cleaning main condenser tube sheets. On July 16, 1989 a short time after restarting circulating water pump 2-1, a condensate pump discharge high cation conductivity alarm annunciated in the Control Room. The Shift Foreman directed the Control Room operators to enter procedure AP-20, which requires power to be reduced. At 27 percent power, feedwater conductivity increased and the reactor was manually tripped per procedure.

The cause of this event was failure of a condenser tube sheet plug. The plug was not recoverable for examination, and therefore the reason for failure could not be determined. The most likely root cause for the failure was either improper plug installation or use of a material susceptible to

corrosion. Other tube sheet plugs were inspected and found to be installed correctly and of the proper material. A new plug was installed in the tube sheet.

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END OF ABSTRACT

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I. Plant Conditions

Unit 2 was in Mode 1 (Power Operation) at approximately 27 percent power.

II. Description of Event

A. Event:

On July 15, 1989, power was reduced to 50 percent and circulating water pump (KE)(P) 2-1 (CWP 2-1) was removed from service to clean the main condenser tube sheets (SG)(COND), and to perform minor maintenance on a main feedwater pump (SJ)(P) and a condensate booster pump (SD)(P). Condenser high backpressure problems were noted by the operators soon after CWP 2-1 was shut down. Power was further reduced to 42 percent in order to stabilize condenser vacuum. Although vacuum is expected to degrade with a single CWP operating, additional investigation and actions to restore condenser vacuum were taken. CWP 2-1 was returned to service following cleaning of the east condenser tube sheets. Plant operators then began to remove circulating water pump 2-2 (CWP 2.2) from service for cleaning of the west condenser tube sheets.

A short time after CWP 2-1 was restarted, condensate pump (SG)(P) discharge high cation conductivity alarms were received in the Control Room. The Shift Foreman directed the Control Room operators to enter Abnormal Operating Procedure AP-20, "Condenser Tube Leak." In accordance with AP-20, CWP 2-2 was restored to service. CWP 2-1 was secured, thus eliminating salt water intrusion into the condensate system.

At 0255 PDT on July 16, 1989, in accordance with AP-20, a power reduction from 42 percent reactor power was commenced in response to a condensate high cation conductivity alarm. At 0258 PDT, at approximately 27 percent reactor power, main feedwater cation conductivity increased, which indicated condensate polisher breakthrough and chloride intrusion into the feedwater system (SJ). The reactor (AB)(RCT) was manually tripped as required by AP-20.

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None.

C. Dates and Approximate Times for Major Occurrences:

1. July 15, 1989, 2029 PDT: Unit 2 was reduced to 50 percent power for planned maintenance.
2. July 15, 1989, 2046 PDT: CWP 2-1 was secured for condenser tube sheet cleaning.

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3. July 15, 1989, 2218 PDT: Turbine load was lowered to 42 percent due to high condenser backpressure.
4. July 16, 1989, 0211 PDT: CWP 2-1 was restarted following completion of condenser tube sheet cleaning.
5. July 16, 1989, 0253 PDT: CWP 2-1 was secured in accordance with Abnormal Operating Procedures.
6. July 16, 1989, 0255 PDT: Reactor power reduction commenced.
7. July 16, 1989, 0258 PDT: Event/discovery date.
Unit 2 reactor was manually tripped in accordance with Abnormal Operating Procedures when high feedwater conductivity alarm occurs.
8. July 16, 1989, 0358 PDT: A 4 hour non-emergency report was made to the NRC in accordance with 10 CFR 50.72.

D. Other Items or Secondary Functions Affected: During the reactor trip diesel generator 2-2 (EK)(DG) started but did not load on its vital bus, in accordance with design. The fuel handling building ventilation system (VG) failed to properly respond to the automatic power transfer. Investigation showed that the fan S-2 inlet vane actuator was sticking. Following several local actuations of the vane actuator, the fan was started and inlet

vanes opened as required. Sticking of the vane actuator could not be duplicated following the local actuations.

E. Method of Discovery:

The Control Room operators were immediately aware of the problem by observation of main annunciator alarms and control board indications.

F. Operator Actions:

The plant was stabilized in Mode 3. Hot Standby. The condensate system was cleaned by feeding and bleeding the condenser hotwell. Steam generator blowdown was restored to return all chemistry parameters to normal.

G. Safety System Responses:

1. The reactor trip breakers (JC)(BKR) opened.

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2. The control rods (AA)(DRIV) inserted into the core.
3. The turbine (TA)(TRB) tripped.
4. The generator (TB)(TG) tripped on anti-motoring timer relay actuation.
5. The auxiliary feedwater pumps (BA)(P) started.

III. Cause of the Event

A. Immediate Cause

The reactor was manually tripped to prevent excessive chloride contamination of the steam generators. This action is required by Abnormal Operating Procedure AP-20.

The immediate cause of the condenser saltwater leakage was failure of a tube sheet plug (installed where a condenser tube had been removed for analysis). This failure resulted in gross salt water inleakage into the condensate (SG) and feedwater systems.

B. Root Cause

The failed condenser tube sheet plug was drawn into the condenser steam space and could not be retrieved for failure analysis. All other condenser tube and tube sheet plugs were inspected for degradation, proper installation and proper material. No other deficiencies were discovered. In addition, there have been no previous condenser tube sheet plug failures.

Since all other tube plugs in the Unit 2 condenser were determined to be acceptable with no significant material degradation, it was concluded that the root cause for the tube sheet plug failure was either improper plug installation or use of a material susceptible to corrosion.

IV. Analysis of the Event

This event consisted of an operator-initiated reactor trip from a low power level. The trip was initiated to protect other plant equipment and would not have occurred automatically since no parameters which require a reactor trip from a reactor protection standpoint were approached. Steam generator blowdown chemistry limits were maintained within guidelines at all times, therefore no significant degradation of the steam generators is expected to result from this event. Thus the health and safety of the public was not adversely affected by this event.

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V. Corrective Actions

A. Immediate Corrective Actions

As discussed in the event description and root cause sections, the condensate system chemistry was restored to normal values using established methods.

The missing tube sheet plug was replaced and all other plugs were inspected for proper installation and satisfactory material condition.

B. Corrective Actions to Prevent Recurrence

No additional corrective actions were deemed necessary, based on

the immediate corrective actions and the fact that the failed plug had been installed where a previously failed tube had been removed for analysis. A number of condenser tubes have failed early in Unit 2's operating history; tube plugging and staking have resolved these failures. Gross condenser tube leakage has essentially been eliminated and a recurrence of this event is not expected.

VI. Additional Information

A. Failed Components:

A condenser tube sheet plug.

B. Previous LERs on similar problems:

None.

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Pacific Gas and Electric Company 77 Beale Street James D. Shiffer
San Francisco, Vice President
CA 94106 Nuclear Power
415/972-7000 Generation
TWX 910-372-6587

August 15, 1989

PG&E Letter No. DCL-89-212

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Re: Docket No. 50-323, OL-DPR-82
Diablo Canyon Unit 2
Licensee Event Report 2-89-007-00
Manual Reactor Trip Due to Seawater Inleakage From a Condenser
Tube Sheet Plug Failure

Gentlemen:

Pursuant to 10 CFR 50.73(a)(2)(iv), PG&E is submitting the enclosed Licensee Event Report (LER) regarding a Unit 2 manual reactor trip from 27 percent power on July 16, 1989. This manual trip was necessary because of seawater

inleakage to the condenser following a tube sheet plug failure.

This event has in no way adversely affected the public's health and safety.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

J. D. Shiffer

cc: J. B. Martin
M. M. Mendonca
P. P. Narbut
H. Rood
B. H. Vogler
CPUC
Diablo Distribution
INPO

Enclosure

DC2-89-OP-N070

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